For more than a decade, 3M has been a trusted supplier of advanced materials for the solar industry. Our broad range of products and technologies is designed to enhance performance, improve reliability and drive down the critical cost per watt. As one of the world’s leading suppliers of advanced films, tapes, coatings and adhesives, we have the ability to supply products and provide technical support around the world.
3M Solar materials offer excellent protection from extreme weather conditions, including high temperatures, moisture, sand and other debris that can damage modules and inhibit system uptime. At the same time, these advanced materials are designed to work together to help increase energy output – driving down the cost per watt, while helping to improve your profit potential.

As one of the world’s leading suppliers of advanced films, tapes, coatings and adhesives, 3M has the ability to supply innovative, high-efficiency products and technical support around the world, for a variety of solar applications, including Crystalline Silicon (c-Si) and Thin Films.

**Crystalline Silicon (c-Si) Solutions**

- Junction Box Bonding
- Backsheet
- Labeling
- Cell Positioning
- Dielectric Insulation
- Anti-Reflective Coating
- Light Redirecting Film
- Charge Collection
- Silicon Cells
- Encapsulant
- Glass
- Frame Bonding
- Frame Free
- Cosmetic Masking

**Thin Film Solutions**

- Junction Box Bonding
- Labeling
- Charge-Collection
- Dielectric Insulation
- Backsheet
- Front Side Film
- Rail Bonding
- Encapsulant
3M™ Film Solutions

3M™ Scotchshield™ Backsheet Film
Moisture, heat and UV rays can seriously damage photovoltaic modules. 3M™ Scotchshield™ Film backsheets are uniquely engineered for maximum protection. Featuring 3M’s innovative fluoropolymer technology and backed by years of proven, real-world performance, 3M Scotchshield Film backsheets deliver outstanding moisture protection, heat resistance and UV stability. The low moisture vapor transmission rate allows for excellent retention of interlayer adhesion after environmental aging. Made with a unique solvent-free manufacturing process, 3M Scotchshield Film backsheets feature a durable outer layer of THV fluoropolymer bonded to PET. Then an extra layer of EVA provides exceptional compatibility with encapsulants for strong, durable bonds. The outer surface is treated to facilitate the use of a broad range of adhesives, tapes and labels.

3M™ Solar Encapsulant Film
3M™ Solar Encapsulant Film is a fast cure encapsulant designed to work with PV modules. It protects against UV damage and weathering, while allowing the maximum amount of visible light transmission to solar cells. Conformable and flexible film is easy to laminate and features a low shrinkage rate. It provides a durable bond with both glass and backsheet. The film has excellent visible light transparency, strong adhesion and elasticity properties required for solar cell encapsulation, plus decades of protection against UV aging, discoloration and weathering.

3M™ Ultra Barrier Solar Film
Transparent 3M™ Ultra Barrier Solar Film can be used to replace glass – enabling high efficiency lightweight, flexible photovoltaic (PV) modules. Designed to address the needs of flexible thin film solar manufacturers, 3M Ultra Barrier Solar Film acts as a replacement for glass with its high light transmission, superb moisture barrier performance and excellent weatherability. 3M Ultra Barrier Solar Film is a multi-layered film made from a 3M proprietary roll to roll vacuum coating process. 3M has combined its knowledge of polymer films, nano technology adhesives and advanced materials to deliver a high-performing front sheet barrier film for the solar industry. 3M Ultra Barrier Solar Film is a UL certified component.
3M™ Cool Mirror Film

3M™ Cool Mirror Film is an all-polymeric wavelength-selective mirror film designed to reflect wavelengths of high conversion efficiency in PV modules, transmit longer infrared wavelengths, and absorb ultraviolet wavelengths. The film can be used in low-concentration PV (LCPV) configurations to increase the amount of light on PV modules, thus significantly increasing energy production while limiting module heating and UV exposure. Increases in annual energy production of up to 34% have been demonstrated versus non-concentrated configurations when using Cool Mirror panels in LCPV configurations*.

* Energy production improvement varies depending on latitude of installation, time of year, PV module tilt, and mirror panel tilt.

3M™ Anti-Reflection Coatings

3M™ Anti-Reflection (AR) Coatings are water-based, durable coatings that increase front glass transmission, thereby raising solar module efficiency. Compared with solvent-based coatings, 3M AR Coatings may result in lower coating defect rates and can reduce costs associated with managing solvent vapors. Designed specifically for OEM use, the products are applied to glass prior to tempering. The glass tempering process increases the coating’s durability and resistance to UV, humidity, and abrasion.
3M™ Charge-Collection Tapes
The tin-plated, deadsoft copper foil tapes with a low outgassing pressure-sensitive adhesive or used in applications requiring excellent electrical conductivity from the substrate through the foil backing. The tin plating facilitates soldering to the backing and resists oxidation and corrosion. Suitable for standard laminating temperatures, these tapes are available in a wide range of configurations for applications as charge collectors or buses within solar panels.

3M™ Dielectric Tapes
3M™ Dielectric Tapes are excellent high temperature tapes for solar PV applications. Available in a wide variety of widths, they are reliable electric insulators with low outgassing adhesive and can be applied automatically to allow for rapid application to maximize productivity.

3M™ Specialty Tapes
3M provides a wide range of tapes designed specifically for use in PV modules. These durable tapes ensure reliable, long-term application for everything from cosmetic masking to cell positioning.
3M™ Solar Acrylic Foam Tapes
For over 30 years, industries worldwide have been using 3M™ Solar Acrylic Foam Tape technology to permanently bond and attach many substrates. The acrylic-based chemistry makes it ideal for critical applications that demand durability, including automotive, electronics, signage, glazing and construction markets.

Frame Bonding
UL-Certified 3M Solar Acrylic Foam Tapes can provide durable attachment solutions for solar module frames. The immediate holding feature allows for high throughput during manufacturing. Compared to sealants, there is no need to clean off any excess material, resulting in less labor and a more professional look. With field experience in millions of solar panels around the world, 3M Solar Acrylic Foam Tape is a time-tested solution for frame bonding.

Junction Box Bonding
3M Solar Acrylic Foam Tape technology enables rapid attachment of junction boxes to solar modules. The easy, no-mess application allows for faster fabrication and can result in a cleaner look, compared to liquid adhesives and mastics. 3M Solar Acrylic Foam Tapes are all UL certified.

Rail Bonding
3M Solar Acrylic Foam Tapes are also available in thicker product constructions to provide an easy, no-mess application when bonding rails to solar modules. 3M Solar Acrylic Foam Tapes are all UL certified.
3M Renewable Energy Division: Unmatched Capabilities

3M’s commitment to the renewable energy industry includes a global organization of research and development, sales, marketing, manufacturing and technical service – all dedicated to developing reliable materials that reduce costs and improve performance.

Expertise
Founded in 1902, 3M has extensive experience developing durable materials for outdoor applications in transportation, commercial graphics and optics. This includes world-class facilities for simulated and real-time weathering exposure and testing.

Innovation
At 3M, the innovation is never-ending. Whether the free-flow of ideas and solutions is occurring among our people, our technologies, our industries or the geographies where we operate, the human and technological connections within 3M enable infinite combinations and applications of expertise as ideas multiply and solutions expand.

Collaborate with 3M
3M innovation is fundamentally about solving problems. We extend an open invitation to access our experts – present your challenges so we can work together to develop answers and solutions and put 3M’s technology to work for you.

For more information on our solar manufacturing product line, contact 3M Renewable Energy at 800-755-2654 or visit us at www.3M.com/solar.

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